Tamarack Allotment Grazing Analysis Project

Invasive Plant Report

July 24, 2017

1 Scale of Analysis

The analysis area for evaluating existing invasive plant populations is consistent with the Tamarack Allotment area. Invasive plant infestations used in the analysis are only those sites located within project area. This analysis will then focus on noxious weed species and the potential for spread for identified species to spread within the analysis area.

2 Methodology and Assumptions

Invasive plants, as defined by the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, are a non-native plant whose introduction does or is likely to cause economic or environmental harm or harm to human health. This analysis will focus on those species that are listed on the Oregon Department of Agriculture noxious weed list. Invasive species and noxious weeds will be used interchangeably in this report.

Invasive plants will be discussed based on inventoried weed sites as well as known weed species that occur in the analysis area that are not inventoried. Known noxious weed sites, soil disturbance, and the potential spread of invasive plants will be the foundation of the analysis. In rating the priority of noxious weeds for treatment and inventory, the Forest classification will be used.

This analysis is tiered to a broader scale analysis (the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 FEIS 2005). The R6 FEIS 2005 culminated in a Record of Decision (R6 2005 ROD) that amended the Umatilla National Forest Plan by adding management direction relative to invasive plants. This project is intended to comply with the new management direction. The portions applicable to the Tamarack Allotment Grazing Analysis Project area include the prevention standards that are detailed in Appendix A.

The Umatilla National Forest Invasive Plants Treatment Project Record of Decision was signed on July 7th, 2010. All of the existing noxious weed infestations within the Tamarack Allotment area are covered under this analysis and have proposed herbicide treatments for the high priority weed species.

3 Existing Conditions

PRIORITY NOXIOUS WEEDS

Table 1 shows noxious weeds of concern within the project area and their associated priority category. Several categories are used to prioritize noxious weed species on the Forest list for treating and inventorying:

1. "Potential Invaders" are noxious weed species that occur on lands adjacent to the Umatilla National Forest but which have not been documented on lands administered by the Forest;
2. "New Invaders" are noxious weed species that occur sporadically on the Umatilla National Forest and which may be controlled by early treatment. This category has been split into two subcategories due to changes in weed populations on the Forest:
    a. “New Invaders” are of limited distribution and can probably be eradicated if early treatment can be implemented.
    b. “New Invaders/Established are those species that are presently controllable but which are approaching “Established” and which are prioritized for early treatment.
3. "Established" species are widespread across the Forest in large populations and containment strategies are used to prevent their further spread.

Table 1: Noxious Weed Species and Priority

Species	Common Name	Priority
Centaurea diffusa	Diffuse knapweed	New Invader/ Established
Centaurea biebersteinii	Spotted knapweed	New Invader/Established
Hypericum perforatum	St. Johnswort	Established
Cirsium arvense	Canada thistle	Established
Cirsium vulgare	Bull thistle	Established
Cymoglossum officinale	Houndstongue	New Invader
Linaria dalatica	Dalmation Toadflax	New Invader
Taeniatherum caput-medusae	Medusa-head	New Invader/Established

Table 2: Existing noxious weed sites within the analysis area that are located on National Forest Land.

Scientific Name	Common Name	Number of Sites	Average Plants per Acre	Number of Acres where Species Occurs
Centaurea diffusa	Diffuse Knapweed	57	10-30+	1073
Cymoglossum officinale	Houndstongue	2	20+	85
Linaria dalatica	Dalmation Toadflax	1	100+	108
Hypericum perforatum	St. Johnswort	38	100+	1091
Taeniatherum caput-medusae	Medusa-head	7	1000+	100+

SPOTTED AND DIFFUSE KNAPWEED

There are 57 sites identified within the project area. Most sites are small with 10-30+ individual plants. There are 1073 acres identified within the project area that Spotted and Diffuse Knapweed have been identified on. Most of these sites are along existing roads within the project area. Sites that are currently inventoried and are cleared for treatment are being treated manually or treated with herbicides. Treatments will continue to occur at these sites.

Manual treatments will be primarily used to treat these small infestations of less than 30 plants. Herbicide treatments may occur if needed on larger sites. Preventing vehicles from spreading knapweed seed into the project area and analysis area would decrease the potential spread and establishment of knapweed.

DALMATIAN TOADFLAX

There is 1 inventoried Dalmatian toadflax site identified within the project area. The site is approximately 108 acres. In 2005 the biological control agent (*Mecinus janthinus*) Toadflax stem weevil, was released on identified sites on the south end of the Heppner Ranger District. This agent has been very effective at spreading and have reduced the number of flowering plants annually on sites that are on the South end of the district. Dalmatian Toadflax appears to establish in harsh sites as well as areas with good soil characteristics and aspect. This species prefers well drained to gravelly soils, through which it spreads by an extensive underground root system. It reproduces both by seed and by sprouting from buds on the roots. Because of their waxy leaves and deep root systems these plants are difficult to control with herbicides. Their capacity to re-sprout from root remnants also makes control by hand-pulling or mechanical means impractical.

HOUNDSTONGUE

There are 2 inventoried houndstongue sites that have been identified within the project area. This sites are approximately 85 acre and there has been anywhere from 10-30 plants annually. It is important to inventory and treat these site before the plants go to seed to reduce the potential for spread. Treatments that have been effective at reducing plants on this site consists of manual and herbicide use. This noxious weed has the potential to spread because of the burr seed that is produced. It is easily transported in fur of domestic and wild animals and in clothing.

MEDUSAHEAD

There are several inventoried sites on adjacent private lands and within the forest boundary within the Tamarack Allotment analysis area. Other sites within the analysis area include some of the arterial roads within the analysis area. This noxious weed has the potential to spread rapidly with disturbance or without disturbance to the landscape. This annual grass species is difficult to control and the primary treatment at this time is to use chemicals. Early detection and rapid response (EDRR) to small populations has been the best means of controlling the spread of this invasive species.

LOW PRIORITY NOXIOUS WEEDS

Three low priority "established" weeds, Canada thistle, Bull thistle, and St. Johnswort, are fairly widespread within the analysis area and are so extensive Forest-wide that they are not generally inventoried. St. Johnswort and bull thistle are less invasive and/or persistent than the

high priority weeds and generally give way to or do not out-compete desirable vegetation. It can be assumed that these three weed species can be found throughout the analysis area.

Low priority weed species, such as Canada thistle, Bull thistle, and St. Johnswort, also readily establish where soil and plant associations have been disturbed. Biological control agents are present on Canada thistle and St. Johnswort in the analysis area; however, success is not known at this time.

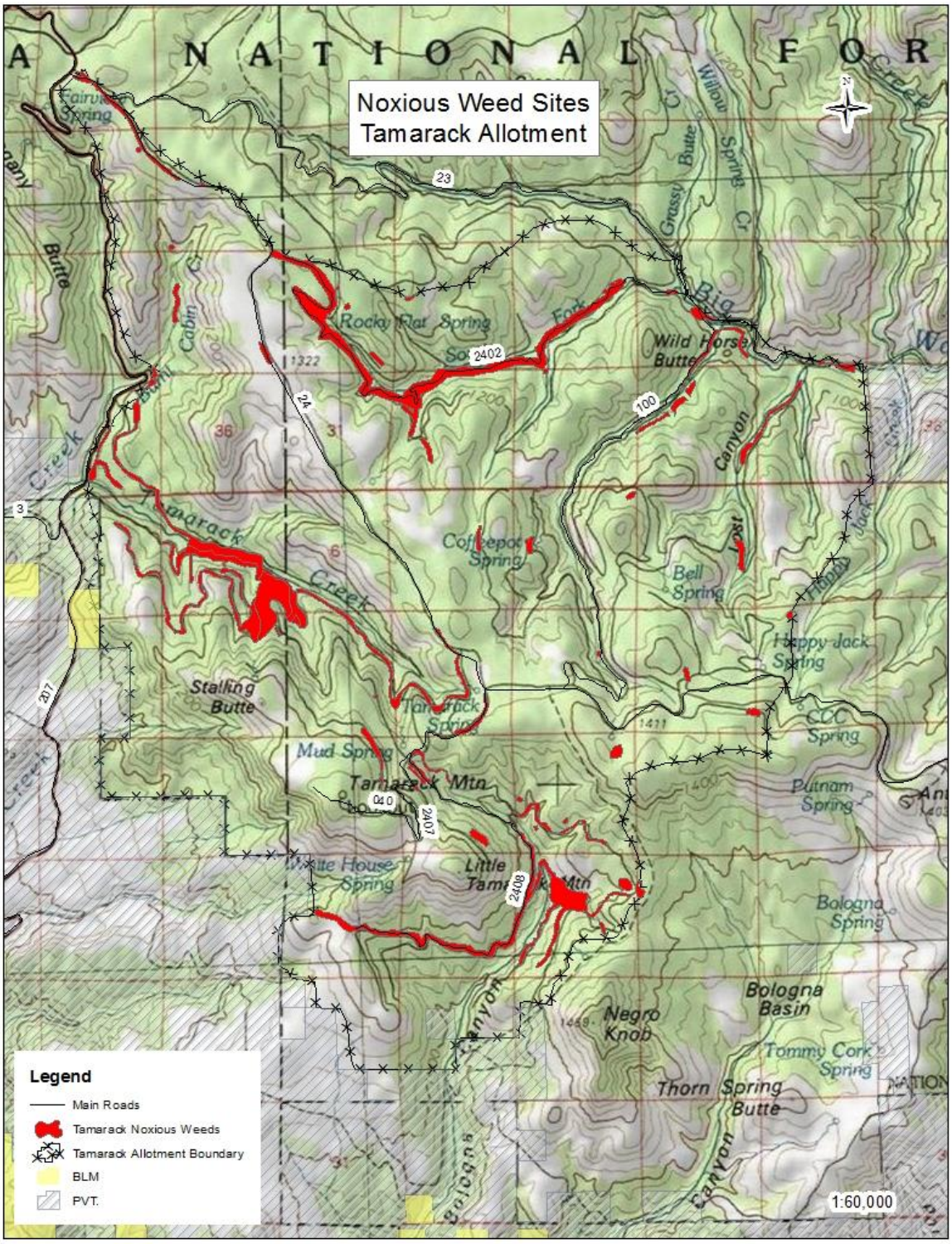

Table 3. Noxious Weed Sites on the Tamarack Allotment

4 Current Grazing Management of the Tamarack Allotment

Livestock grazing can cause soil disturbance and/or affect plant communities that allow noxious weeds to become established and spread. The current management of livestock on the Tamarack Allotment is to limit the amount of soil displacement that is caused by livestock. Annual grazing plans (Annual Operating Instructions) limit the duration and intensity of livestock use to reduce soil disturbance and allow desirable plant communities to remain viable. Healthy plant communities are less susceptible to the establishment and spread of noxious weed species. Permittees are instructed annually during the spring meeting about washing vehicles before they enter the National Forest. The permittees are encouraged to watch for weeds on the National Forest and report weeds that are found. Prevention strategies in **Appendix B** apply to the grazing and related management of the area located on the Tamarack Allotment.

5 Environmental Consequences

DIRECT AND INDIRECT EFFECTS COMMON TO ALL ACTION ALTERNATIVES

Ground disturbing activities have the potential to create areas of soil disturbance that may lead to the establishment and spread of invasive plants. Ground disturbing activities may increase the potential for invasive plants to become established, however many invasive species can become established without disturbance. Invasive plants can compete and out-compete native species resulting in a decline in native species diversity and affect plant community condition and succession.

Livestock grazing can affect the ability of native plant communities to out-compete and prevent invasive species from becoming established and spreading. Livestock grazing can also be a vector for the dispersal of invasive plant seeds. The following prevention standards and design criteria have been prescribed for each of the action alternatives to reduce the risk of the spread and establishment of invasive plants.

- Prescribed utilization standards for upland and riparian vegetation (Umatilla National Forest LRMP)
- Permitted numbers and season of use (Term Grazing Permit).
- If hay is used for livestock, certified weed free hay will be required (Prevention Standard #4 R6 FEIS 2005).
- Native plant material will be the first choice for rehabilitation or restoration work. (Prevention Standard # 13, R6 FEIS 2005)
- Equipment used outside of the road prism (maintenance of range improvements) will be

required to be cleaned prior to entering National Forest Land. (Prevention Standard #2 R6 FEIS 2005).

- The invasive plant coordinator and range managers will work closely together to make adjustments to the annual grazing schedule for cattle in relation to invasive plant populations (Design Criteria).
- Maps in the Allotment Management Plans will show current, inventoried, high priority, noxious weed infestations to be avoided and/or monitored. (Prevention Standard #6)

All action alternatives have prescribed utilization standards, relatively low stocking rates, and a deferred grazing system that is designed to reduce negative effects to plant community health. This in turn will reduce the risk of the establishment and spread of invasive species.

Areas where cattle are concentrated can result in soil disturbance that may lead to the establishment and spread of invasive plants. These areas include corrals, water developments, and fence lines are considered high risk areas for soil disturbance. There are no known weed sites within these improvements where disturbance is the highest from concentrating livestock.

Roadside infestations account for over 85% of the infestations within all action alternatives. The roadside infestations within the allotment are primarily knapweed species. Cattle can potentially control the spread of noxious weeds by grazing undesirable vegetation (noxious weeds) A study conducted by Colorado State University determined that grazing knapweed twice in the spring decreased seed set by 50% and reduced tumbling-offsite by 15% (K.G. Beck, 2008). As a result, grazing livestock on knapweed sites before seed set may reduce seed production. Cattle's grazing in all infestations of invasive plants after seed maturity poses a risk of spreading seeds (University of Idaho, 2006).

Cattle are hauled and driven onto National Forest Land each year around May 1st. There is a potential for cattle to bring invasive plant seeds onto the allotment during this time.

All action alternatives include the prevention standards described in the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program signed in 2005. All alternatives have been designed to be consistent with the Umatilla Land and Resource Management Plan as amended by the R6 FEIS 2005 Record of Decision for Invasive Plants.

CUMULATIVE EFFECTS COMMON TO ALL ACTION ALTERNATIVES

Roads are the highest risk area for invasive plants within the project area. Over half of the existing infestations are found along roads. Maintenance of road systems within the project area will continue to occur. Cattle grazing primarily occurs away from roads. The management and movement of livestock often occurs on roads and trails within the analysis area. There is a potential for cumulative effects with road maintenance and cattle grazing to cause the establishment and spread of invasive plants.

Recreational use within the allotment will continue to be a vector for the establishment and spread of invasive plants. High risk areas include the trail heads, roads, and dispersed camps.

Harvest and fuels reduction activities will continue to occur within the allotment area. Prevention standards will be required during these activities, reducing the risk of invasive plant infestations. Harvest and fuel reduction activities create transitory rangeland that cattle use.

Prescribed burning and wildfires will continue to occur within the allotment. Adjustments to the grazing schedules can occur within burned areas until such time as conditions have improved to a level suitable to allow grazing again. As a result, the cumulative effects of burning and cattle grazing will be minimal.

DIRECT AND INDIRECT EFFECTS OF ALTERNATIVE 1 (NO GRAZING)

Alternative 1 would not authorize livestock grazing within the Tamarack Allotment. If this alternative was chosen, there would be no environmental effects concerning invasive plants as a result of livestock grazing. This Alternative provides the lowest amount of risk to the spread of existing or new infestations within the project area.

Ponds, troughs, and corrals would be restored, removed, or abandoned from the allotment. Livestock would no longer concentrate at these areas; therefore, soil disturbance would be greatly reduced at these sites. The potential for noxious weed establishment or spread by other means would continue.

New noxious weed infestations would likely continue to be found along roads, trails, and dispersed camping areas.

Treatment efforts would continue to occur within the project area consistent with NEPA decisions regarding weed control. Low priority species would most likely continue to spread to some extent due to a lack of treatment efforts, while high priority infestations will likely be controlled through treatment efforts.

The no grazing alternative would eliminate grazing on approximately 19,441 acres. This alternative would reduce the risk of the establishment and spread of noxious weeds caused by cattle. Within this analysis area there are 91 inventoried sites. There are 60 high priority sites approximately 3,059 acres invasive plants. Livestock grazing would no longer be a concern within or adjacent to these 499 acres of invasive plants.

There are a total of 13 infestations that total approximately 499 acres within the 27,051 acre allotment (**Table 2**). Approximately 1.8% of the allotment area is infested with invasive plants. About 425 acres of the 499 acres of invasive plant infestations are located along roads and right of ways. The other 15% of the infestations are often found within managed timber stands and are generally low priority species such as mullein, bull thistle, and St. Johnswort.

Species Code	Common Name	Number of Sites	Type of Treatment[1]	Avg. Plants/Site (variable)	Acres[2]
**CEBI2/ CEDI3	Spotted Knapweed/ Diffuse Knapweed	57	Manual/Chemical	8-100	1073
**LIDA	Yellow Toadflax	1	Biological/Chemical	100+	108
HYPE	St. Johnswort	38	Biological/Manual/Chemical	13	1091
**CYOF	Houndstongue	2	Manual/Chemical	10	85
TACA8	Medusahead Rye	3	Chemical	100+	350

Table 4. Table: Current Noxious Weed Site Treatment under Alternative 1 (No Grazing)

[1] There is a potential overlap of between acres of Knapweed, and St. Johnswort. Many sights contain both species.

[2] There is a potential overlap of between acres of Knapweed, and St. Johnswort. Many sights contain both species.

6 References

U.S. Department of Agriculture, Forest Service, Pacific Northwest Region; FEIS for Managing Competing and Unwanted Vegetation, and the associated Mediated Agreement, Nov 1988.

U.S. Department of Agriculture, Forest Service. The Guide for Conducting Vegetation Management Projects in the Pacific Northwest Region (R6 Guide to Vegetation Management Projects)

U.S. Department of Agriculture, Forest Service, Pacific Northwest Region; Land and Resource Management Plan for the Umatilla National Forest (FEIS), 1990. Whitson Tom D, Burrill Larry C, Dewey Steven A, Cudney David W, Nelson B.E., Lee Richard D., Parker Robert. Weeds of the West. The Western Society of Weed Science, Revised 1992. U.S. Department of Agriculture, Forest Service, Pacific Northwest Region; Heppner Ranger District Noxious Weed Monitoring Data, Heppner RD 2000-2004. USFS (U.S. Forest Service). 2002. Field Guide – Invasive Plant Inventory, Monitoring and Mapping Protocol. USDA Forest Service.

NPS (National Park Service). 2002. Invasive Plants Inventory and Monitoring Guidelines, National Park Service.

K.G. Beck, 2008—Colorado State University Extension, Diffuse and Spotted knapweed, 2008. http://www.ext.colostate.edu/Pubs/natres/03110.html

Wilson, Davison, Smith 2006--- University of Idaho, Livestock Grazing Guidelines for Controlling Noxious Weeds in the Western United States, EB-06

7 Appendix A

Goals and objectives for Invasive Species from the Pacific Northwest Region Invasive Plant Program Final Environmental Impact Statement, Record of Decision, October 2005.

Table 5. Goal 1 - Protect ecosystems from the impacts of invasive plants through an integrated approach that emphasizes prevention, early detection, and early treatment. All employees and users of the National Forest recognize that they play an important role in preventing and detecting invasive plants.

Objective Number	Goals and Objective
Objective 1.1	Implement appropriate invasive plant prevention practices to help reduce the introduction, establishment and spread of invasive plants associated with management actions and land use activities.
Objective 1.2	Educate the workforce and the public to help identify, report, and prevent invasive plants
Objective 1.3	Detect new infestations of invasive plants promptly by creating and maintaining complete, up-to-date inventories of infested areas, and proactively identifying and inspecting susceptible areas not infested with invasive plants.
Objective 1.4	Use an integrated approach to treating areas infested with invasive plants. Utilize a combination of available tools including manual, cultural, mechanical, herbicides, biological control.
Objective 1.5	Control new invasive plant infestations promptly, suppress or contain expansion of infestations where control is not practical, conduct follow up inspection of treated sites to prevent reestablishment.

Table 6. Goal 2 - Minimize the creation of conditions that favor invasive plant introduction, establishment and spread during land management actions and land use activities. Continually review and adjust land management practices to help reduce the creation of conditions that favor invasive plant communities.

Objective Number	**Goals for this Objective**
Objective 2.1	Reduce soil disturbance while achieving project objectives through timber harvest, fuel treatments, and other activities that potentially produce large amounts of bare ground

Objective Number	Goals for this Objective
Objective 2.2	Retain native vegetation consistent with site capability and integrated resource management objectives to suppress invasive plants and prevent their establishment and growth
Objective 2.3	Reduce the introduction, establishment and spread of invasive plants during fire suppression and fire rehabilitation activities by minimizing the conditions that promote invasive plant germination and establishment.
Objective 2.4	Incorporate invasive plant prevention as an important consideration in all recreational land use and access decisions. Use Forest-level Access and Travel Management planning to manage both on-highway and off-highway travel and travel routes to reduce the introduction, establishment and spread of invasive plants.
Objective 2.5	Place greater emphasis on managing previously "unmanaged recreation" (OHVs, dispersed recreation, etc.) to help reduce creation of soil conditions that favor invasive plants, and reduce transport of invasive plant seeds and propagules.

Table 7. Goal 3 - Protect the health of people who work, visit, or live in or near National Forests, while effectively treating invasive plants. Identify, avoid, or mitigate potential human health effects from invasive plants and treatments.

Objective Number	Goals for this Objective
Objective 3.1	Avoid or minimize public exposure to herbicides, fertilizer, and smoke
Objective 3.2	Reduce reliance on herbicide use over time in Region Six

Table 8. Goal 4 – Implement invasive plant treatment strategies that protect sensitive ecosystem components, and maintain biological diversity and function within ecosystems. Reduce loss or degradation of native habitat from invasive plants while minimizing adverse effects from treatment projects.

Objective Number	Goals for this Objective
Objective 4.1	Maintain water quality while implementing invasive plant treatments.

Objective Number	Goals for this Objective
Objective 4.2	Protect non-target plants and animals from negative effects of both invasive plants and applied herbicides. Where herbicide treatment of invasive plants is necessary within the riparian zone, select treatment methods and chemicals so that herbicide application is consistent with riparian management direction, contained in Pacfish, Infish, and the Aquatic Conservation Strategies of the Northwest Forest Plan.
Objective 4.3	Protect threatened, endangered, and sensitive species habitat threatened by invasive plants. Design treatment projects to protect threatened, endangered, and sensitive species and maintain species viability.

Table 9. Goal 5 – Expand collaborative efforts between the Forest Service, our partners, and the public to share learning experiences regarding the prevention and control of invasive plants, and the protection and restoration of native plant communities.

Objective	Goals for this Objective
Objective 5.1	Use an adaptive management approach to invasive plant management that emphasizes monitoring, learning, and adjusting management techniques. Evaluate treatment effectiveness and adjust future treatment actions based on the results of these evaluations.
Objective 5.2	Collaborate with tribal, other federal, state, local and private land managers to increase availability and use of appropriate native plants for all land ownerships.
Objective 5.3	Work effectively with neighbors in all aspects of invasive plant management: share information and resources, support cooperative weed management, and work together to reduce the inappropriate use of invasive plants (landscaping, erosion control, etc.).

8 Appendix B

Standards for Invasive Species Prevention from the Pacific Northwest Region Invasive Plant Program Final Environmental Impact Statement, Record of Decision, October 2005 that applies to the Tamarack Allotment

Standard #1: Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis, roads analysis, fire and fuel management plans, recreation management plans, vegetation management plans, and other land management assessments. (This standard will apply to all assessments and analysis documents started or underway as of March 1, 2006; this standard does not apply to assessments and analysis documents signed or completed by February 28, 2006.)

Standard #2: Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands. This standard does not apply to initial attack of wildland fires, and other emergency situations where cleaning would delay response time.

Standard #3: Use weed-free straw and mulch for all projects conducted or authorized by the Forest Service on National Forest System Lands. If State certified straw and/or mulch is not available, individual forests should require sources certified to be weed free using the North American Weed Free Forage Program standards, or a similar certification process.

Standard #4: Use only pelletized or certified weed free feed on all National Forest System lands. If state certified weed free feed is not available, individual Forests should require feed certified to be weed free using North American Weed Free Forage Program standards or a similar certification process. Choose weed-free project staging areas, livestock and packhorse corrals, and trailheads.

Standard #6: Use available administrative mechanisms to incorporate invasive plant prevention practices into rangeland management. Examples of administrative mechanisms include, but are not limited to, revising permits and grazing allotment management plans, providing annual operating instructions, and adaptive management. Plan and implement practices in cooperation with the grazing permit holder.

Standard #13: Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely regeneration of the native plant community is not likely to occur.

9 Appendix C

Design Criteria of all Action Alternatives for Invasive Plants

Design Criteria include the following:

- Noxious weeds will be considered under this analysis. (Prevention Standard #1)
- Maps in the Allotment Management Plans will show current, inventoried, high priority, noxious weed infestations to be avoided and/or monitored. (Prevention Standard #6)
- Noxious weed prevention measures will be incorporated in allotment management plans. Information on noxious weed identification, methods of spread, and prevention measures will be provided to permittees verbally or in Allotment Management Plans. (Prevention Standard #6)
- Permittees will be encouraged to identify new infestations of noxious weeds and report these annually to the Forest Service. (Prevention Standard #6)
- All equipment used off of the road prism will be cleaned in a manner sufficient to prevent noxious weeds from being carried onto the analysis area. This requirement does not apply to passenger vehicles or other equipment used exclusively on roads. Cleaning will occur off of National Forest System lands. Cleaning will be inspected and approved by the Forest Officer in charge of administering the project. (Prevention Standard #2)
- Any seed or straw used in restoration will be certified weed free. The first choice being native seed. (Prevention Standards #3 and #13)
- Pelletized or certified weed free feed will be required on the Tamarack Allotment. (Prevention Standard #4)

10Appendix D

Cost of Noxious Weed Management

The current annual cost for inventorying, monitoring, and controlling noxious weeds in the analysis area is approximately $20/acre. This figure is averaged across all sites realizing that large infestations are more costly than small infestations. The Heppner Ranger District spends approximately $6,500 annually to monitor, inventory, and/or control noxious weeds in the Tamarack Allotment. This cost includes noxious weed sites associated with other projects in the Tamarack Allotment (roads, gravel pits, managed timber stands, dispersed camping areas, etc.)

11Appendix E

Monitoring

Identified weed sites on the Tamarack Allotment are inventoried annually. Sites that are identified on the allotment are entered annually into a corporate data base that identifies each site with a number and specific information about the site (example, date weed was found, location, species and treatment). These sites are looked at annually to see if weeds are present and if over a period of 3-5 years no weeds are present the site is still in the data base but no longer is a priority to inventory annually. New sites that have been inventoried are entered into the data base annually.

12 Appendix F

Pertinent Prevention Standards for Invasive Species Prevention from the Pacific Northwest Region Invasive Plant Program Final Environmental Impact Statement, Record of Decision, October 2005.

Standard #1: Prevention of invasive plant introduction, establishment and spread will be addressed in watershed analysis, roads analysis, fire and fuel management plans, recreation management plans, vegetation management plans, and other land management assessments. (This standard will apply to all assessments and analysis documents started or underway as of March 1, 2006; this standard does not apply to assessments and analysis documents signed or completed by February 28, 2006.)

Standard #2: Actions conducted or authorized by written permit by the Forest Service that will operate outside the limits of the road prism (including public works and service contracts), require the cleaning of all heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) prior to entering National Forest System Lands. This standard does not apply to initial attack of wildland fires, and other emergency situations where cleaning would delay response time.

Standard #3: Use weed-free straw and mulch for all projects conducted or authorized by the Forest Service on National Forest System Lands. If State certified straw and/or mulch is not available, individual forests should require sources certified to be weed free using the North American Weed Free Forage Program standards, or a similar certification process.

Standard #7: Inspect gravel, fill, sand stockpiles, quarry sites, and borrow material for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel, fill, sand, and rock that is judged to be weed free by District or Forest weed specialists.

Standard #8: Conduct road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants in consultation with District or Forest-level invasive plant specialists; incorporate invasive plant prevention practices as appropriate.

Standard #13: Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely regeneration of the native plant community is not likely to occur.

13 Appendix G

SERA risk assessments do not warrant changes to 2010 weed EIS

Supplemental Information Report for Umatilla NF 2010 Invasive Plant FEIS Updated Herbicide Risk Assessments

Rochelle Desser January 29, 2015

I prepared this supplemental information report for the Umatilla National Forest to help the Forest respond to public comments about whether or not the updated glyphosate herbicide risk assessment changed conclusions from the Umatilla 2010 Invasive Plant Treatment FEIS. Forest Service regulations (36 CFR 220) require the Forest Service to stay alert for new information that may influence the way an ongoing project is implemented. Updated risk assessments have been prepared for four herbicides discussed in the Umatilla 2010 FEIS.

The updated herbicide risk assessments are available online at Forest Service Pesticide Use Risk Assessments[3] and herbicide labels are available at Service Pesticide Labels.[4]

Table 10. List of Herbicide Risk Assessments in 2011

Herbicide Active Ingredient	Date	Reference Number
Glyphosate	March 25, 2011	SERA TR-052-22-03b
Imazapyr	December 16, 2011	SERA TR-052-29-03a
Picloram	September 29, 2011	SERA TR-052-27-03a
Triclopyr BEE and TEA	May 24, 2011	SERA TR 052-25-03a

While hazard quotient values for similar exposures were greater or smaller in the updated risk assessments, compared to disclosures in the Umatilla 2010 FEIS, overall conclusions about impacts remain valid and no changes to the project design criteria are needed. The cautious approach in the Umatilla 2010 project has accounted for any increased HQ values and additional exposure scenarios discussed in the updated risk assessments.

Beyond the HQ values, the updated risk assessments do not indicate new risks or differences in relative risk between the herbicides. Some new exposure scenarios for wildlife and human

[3] If link does not work, use URL: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

[4] If link does not work, use URL: http://www.cdms.net/Label-Database

health are addressed in the updated risk assessments but the results do not indicate any need to change the project or supplement the EIS.

The following sections discuss updated risk assessment and findings in the Umatilla 2010 FEIS for wildlife, fish and people. The updated risk assessments do not change findings for botany, soil and water, recreation, economic or heritage resources.

WILDLIFE

The 2011 updated risk assessments included in some new exposure scenarios and changes in HQ values for some existing exposure scenarios however the effects disclosures in the Umatilla 2010 FEIS remain valid.

New Wildlife Exposure Scenarios

New acute exposure scenario: A new scenario has been developed for a small bird feeding on sprayed vegetation. Under this scenario, exposure to triclopyr sprayed at the typical rate had HQ values greater than 1, assuming typical rates. At maximum rates only, picloram and glyphosate HQ values for this scenario also exceed 1.

New chronic exposure scenario: The updated risk assessments address chronic exposure to small birds and mammals from eating contaminated vegetation. HQ values for glyphosate and picloram sprayed at the highest rate exceeded 1 (no exceedances were predicted for the typical rate). No herbicide would be spot or broadcast sprayed at the highest rate so this exposure scenario is not plausible.

The updated risk assessment also predicted greater risks to small birds and mammals associated with chronic exposure to triclopyr sprayed at typical and maximum rates. Triclopyr would not be applied by broadcast (spot and selective treatments only), which would reduce risks from exposure. Chronic exposure to triclopyr is implausible given the relatively low extent of use on and off the Forest. The Umatilla 2010 FEIS estimated that triclopyr would be an effective herbicide on fewer than 200 acres Forest-wide. The Umatilla 2010 FEIS addressed the potential risks associated with triclopyr use and included appropriate design criteria for wildlife.

Changes in HQ values associated with existing exposure scenarios

Minor changes in HQ values were predicted in the updated risk assessments for existing acute exposure scenarios related to mammals and birds consuming contaminated vegetation.

- Glyphosate – Updated risk assessment resulted in HQ values greater than 1 only at highest application rates; these are implausible for the Umatilla project
- Imazapyr – No change in evaluation of risk, no scenarios over HQ = 1
- Picloram – HQ values for acute exposures have gone down for mammals and up for birds (acute consumption of contaminated vegetation). However, no HQ values greater than 1 are associated with use of picloram at typical rates.

- Triclopyr – HQ values for acute scenarios have increased for large and small mammals (acute consumption of contaminated vegetation). However, these scenarios are unlikely to actually occur given the design criteria, herbicide use buffers and relatively low extent of use.

The following table summarizes herbicide risk assessment scenarios that 1) are associated with HQ values greater than 1 for wildlife and 2) differ from the Umatilla 2010 FEIS results.

Code letter meanings for the following table are as follows:

A: Exposure scenario results in a dose below or equivalent to the toxicity index at typical and highest application rates.

B: Exposure scenario results in a dose that exceeds the toxicity index at typical and highest application rates.

C: Exposure scenario results in a dose that exceeds the toxicity index at highest application rates only (implausible for this project).

Table 11. Acute, Consumption Contaminated Vegetation

Animal/Scenario	Glyphosate	Imazapyr	Picloram	Triclopyr
small mammal	C	A	C – new or changed result	B – new or changed result
large mammal	C	A	A[5] – new or changed result	B[6] – new or changed result
large bird	A	A	A	B
small bird (new scenario)	C – new or changed result	A – new or changed result	C – new or changed result	B – new or changed result

Table 12. Table 12. Chronic Vegetation Consumption

Animal/Scenario	Glyphosate	Imazapyr	Picloram	Triclopyr
small mammal (new scenario)	C [1] -new or changed result	A	B[1] – new or changed result	B[1]
small bird (new scenario)	C [1] –new or changed result	A	B[1] – new or changed result	B-[1] new or changed result

[5] The FEIS showed the toxicity index was exceeded at the highest application rate; Lower HQ in updated risk assessment

[6] New scenario or increased HQ value compared to Umatilla 2010 FEIS findings

SOILS AND WATER

The findings related to direct and indirect impacts to soils and water have not changed since the release of the 2010 FEIS. The updated risk assessments and changes in invasive plant inventory do not result in changes to findings about soil and water.

AQUATIC ORGANISMS

The findings related to direct and indirect impacts to fish and aquatic organisms have not changed since the release of the 2010 FEIS. Changes in risk assessments resulted in some increases in HQ values. The toxicity threshold for glyphosate (without surfactant) for effects to fish has changed from 0.5 to 0.1mg/l, due to findings in a paper regarding potential impact on salmon olfactory sensitivity. This increases the HQ values given the same exposure, however this does not change the overall impact analysis or findings about non-lethal impacts.

HUMAN HEALTH

The pre-2005 risk assessments are compared to the 2011 risk assessments in the table below:

Table 13. Comparison of Glyphosate Risk in 2003 to the Glyphosate Risk in 2011

Glyphosate Risk Assessment (2003)	Glyphosate Risk Assessment (2011)	Changed Condition Findings
No operational worker exposures over a threshold of concern.	No operational worker exposures over a threshold of concern.	No change.
No public health exposures over a threshold of concern (non-accidental).	A new public health scenario was modeled in the 2011 risk assessment: acute consumption of contaminated vegetation (not fruit) by a woman immediately after spraying. The 2011 glyphosate risk assessment indicates that the HQ value would equal 1.4 at the "upper bound" estimate for the herbicide application rate of 2lb per acre. No other non-accidental human health exposures exceeded the reference dose.	The new scenario of consumption of contaminated vegetation is implausible because a woman would have to consume 1 pound of vegetation immediately after spraying. The HQ = 1.4 is a slight exceedance over the threshold of concern. The threshold of concern is several orders of magnitude below the level thought to cause a human health impact. Therefore, this change does not substantially affect the findings in the Umatilla 2010 FEIS.
For an accidental spill of 200 gallons of herbicide into a small pond, the HQ = 2 for a small child drinking water out of the pond immediately after the spill.	No change. Because of the herbicide handling and transportation safety PDFs that limit the amount of herbicide that could be transported, and the low plausibility of a child drinking from a pond immediately after a spill, the risk associated with this scenario remains low in all alternatives for the Umatilla project.	No change. Because of the herbicide handling and transportation safety PDFs that limit the amount of herbicide that could be transported, and the low plausibility of a child drinking from a pond immediately after a spill, the risk associated with this scenario remains low in all alternatives for the Umatilla project.

Glyphosate Risk Assessment (2003)	Glyphosate Risk Assessment (2011)	Changed Condition Findings
	Additional exposure scenarios have been added to the updated risk assessment (for example, a woman swimming in a stream that has been contaminated with herbicide for one hour). The amount of herbicide that is modeled to reach the stream is based on the GLEAMS estimate of 10 acres of broadcast spray along 1.6 miles of stream. All exposure estimates were below a threshold of concern for dermal exposure or water consumption.	No change in findings.

Table 14. Comparison of 2004 Imazapyr Risk to the Imazapyr Risk in 2011

Imazapyr Risk Assessment (2004)	Imazapyr Risk Assessment (2011)	Changed Condition Findings
No human health exposures scenarios (worker, public or accidental) exceeded the threshold of concern.	No human health exposures scenarios (worker, public or accidental) exceeded the threshold of concern. Additional exposure scenarios have been added to the updated risk assessment (for example, a woman consuming contaminated vegetation or swimming in a stream that has been contaminated with herbicide for one hour). The amount of herbicide that is modeled to reach the stream is based on the GLEAMS estimate of 10 acres of broadcast spray along 1.6 miles of stream. All exposure estimates were below a threshold of concern for dermal exposure or water consumption.	No change.

Table 15. Comparison of Picloram Risk in 2003 to the Picloram Risk in 2011

Picloram Risk Assessment (2003)	**Picloram Risk Assessment (2011)**	**Changed Condition Findings**
No worker exposure scenarios exceeded the threshold of concern.	No worker exposure scenarios exceeded the threshold of concern.	No change.
No non-accidental public exposures over a threshold of concern.	A new public health exposure scenario modeled in the 2011 risk assessments: chronic consumption of contaminated vegetation (not fruit) by a woman immediately after spraying. The HQ value of 2 was calculated at the upper bound (the central estimate was 3 orders of magnitude below 1). This indicates a slight exceeding of the reference dose, however, the reference dose is orders of magnitude below the level thought to cause an effect. This scenario is unlikely because a woman would have to consume 1 pound of vegetation immediately after spraying, which is unlikely. No other non-accidental human health exposures exceeded the reference dose (including new exposure scenarios such as swimming).	The new scenario of consumption of contaminated vegetation is implausible because a woman would have to consume 1 pound of vegetation immediately after spraying. The HQ = 2 is a slight exceedance over the threshold of concern. The threshold of concern is conservation and is several orders of magnitude below the level thought to cause a human health impact. Therefore, this change does not substantially affect the findings in the Umatilla 2010 FEIS.

Picloram Risk Assessment (2003)	**Picloram Risk Assessment (2011)**	**Changed Condition Findings**
For an accidental spill of 200 gallons of herbicide into a small pond, the HQ = 3 for a small child drinking water out of the pond immediately after the spill.	The 2011 accidental spill scenario for a child drinking water after 200 gallons are spilled into a pond went down from HQ =3 to HQ =1. This appears to be because the reference dose (threshold of concern) for this scenario was increased in 2011.	No change. This is an extreme and implausible exposure scenario, especially given the project design criteria associated with the Umatilla project that restrict the amount of herbicide that would be transported to the field. Nor is it plausible that a child would drink water out of a pond immediately after a spill.

Table 16. Comparison of Triclopyr Risk in 2003 to the Triclopyr Risk in 2011

Triclopyr (2003)	**Triclopyr (2011)**	**Changed Condition Findings**
Triclopyr TEA – HQ = 1.6 for general worker exposure.	Triclopyr TEA - HQ = 1.6 for general worker exposure	No change. There appears to be an error in the R6 2005 FEIS that uses a value of 16 for chronic worker exposure, and this is referenced in the Umatilla 2010 FEIS. The risk assessment value, based on an application rate of 1 lb. per acre, for backpack spraying was 1.6 (not 16), at the upper bound. This indicates a lower level of risk than was reported in the Umatilla FEIS.

Triclopyr TEA - Several acute public health exposures exceeded a threshold of concern for TEA. These included: HQ = 3 for direct spray of a child at the upper bound estimate, HQ = 7 for direct spray of a woman at the upper bound estimate, and HQ = 1.3 for a woman brushing up against contaminated vegetation at the upper bound estimate. No HQ values exceeded 1 at central estimates.	Triclopyr TEA - Reduced HQ values for some of the upper bound, implausible exposure scenarios (HQ reduced from 3 to 0.2 for direct spray of a child, HQ reduced from 7 to 0.5 for direct spray of a woman). For a woman eating 1 lb. of contaminated fruit directly after spraying, the upper bound HQ value increased from below 1 to 4. The increase in HQ is due to a reduction in the toxicity threshold because of potential additional sensitivity of a woman of child bearing age. However, the central bound remains below an HQ of 1. A new exposure scenario was included in the 2011 risk assessment that was not in the 2003 risk assessment, for a woman eating about a pound of contaminated vegetation (not	The changes in the values in the risk assessment do not change the interpretations of risk in the Umatilla FEIS. This is because the scenarios described in the risk assessment are unlikely to actually occur. Triclopyr use is limited to spot or selective application. Direct spray of a person is implausible with these methods. Consumption of contaminated fruit is implausible both because the amount of fruit that would have to be consumed and the project design criteria that require posting of treated areas and use of dye to mark treated areas. It is even less likely that someone would eat a pound of contaminated vegetation after it has been sprayed. Upper bound estimates also are extreme; central estimates are more realistic, especially given the project design criteria associated with the Umatilla project.

	fruit) resulted in an upper bound HQ of 27 and a central estimate of HQ = 3 for acute exposures. Upper bound chronic estimates for a woman eating contaminated fruit or vegetation over a long period time also increased in the 2011 risk assessment, with respective upper bound HQ values calculated at 3 and 6, respectively. No other non-accidental scenarios (including swimming) exceed a threshold of concern.	

Triclopyr (2003)	**Triclopyr (2011)**	**Changed Condition Findings**
Triclopyr TEA - For an accidental spill of 200 gallons of herbicide into a small pond, the HQ = 2 for a small child drinking water out of the pond immediately after the spill.	Triclopyr TEA - For an accidental spill of 200 gallons of herbicide into a small pond, the HQ = 2 for a small child drinking water out of the pond immediately after the spill.	No change.

Triclopyr (2003)	**Triclopyr (2011)**	**Changed Condition Findings**
Triclopyr BEE - Worker exposures over a threshold of concern included: HQ = 1.6 for general exposure; HQ = 4 for a worker wearing gloves saturated with herbicide for one hour (upper bound estimates)	Triclopyr BEE - Worker exposures over a threshold of concern included: HQ = 6 for general exposure (upper bound estimate); HQ = 7 for a worker wearing gloves saturated with herbicide for one hour (upper bound estimates). Central estimates are below a threshold of concern.	There appears to be an error in the R6 2005 FEIS that uses a value of 16 for chronic worker exposure, and this is referenced in the Umatilla 2010 FEIS. This indicates a lower level of risk than was reported in the Umatilla FEIS. The increase in the upper bound estimates for accidental worker exposure do not indicate a greater level of risk than disclosed in the Umatilla 2010 FEIS. The upper bound estimate is extreme and assumes no project design criteria are followed. Standard worker precautions are requiring licensed applicators supervise projects make upper bound accidental exposures unlikely to actually occur.
Triclopyr BEE: Public health exposures over a threshold of concern included: HQ = 6 for direct spray of a child at the	Triclopyr BEE: Direct spray of a child at the upper bound estimate is below 1; HQ for direct spray of a woman at	The changes in the values in the risk assessment do not change the interpretations of risk in the Umatilla FEIS. This is because the scenarios described in the risk assessment are unlikely to actually occur. Triclopyr use is limited to spot or

Triclopyr (2003)	Triclopyr (2011)	Changed Condition Findings
upper bound estimate, HQ = 11 for direct spray of a woman at the upper bound estimate. None of the central estimates for these scenarios exceeded an HQ = 1. The HQ = 1.7 was calculated for a woman brushing up against contaminated vegetation at the upper bound estimate. Under this same scenario, HQ values were 1.3 at the central estimate. No other public exposure scenarios exceeded a threshold of concern.	the upper bound estimate is 1.4. HQ values for consumption of 1 lb. of fruit contaminated with triclopyr BEE increased from an HQ below 1 to an HQ of 4 (at the upper bound). The new scenario of a woman eating 1 lb. of contaminated vegetation resulted in an HQ value of 27 at the upper bound, and 3 at the central estimates. Chronic consumption of contaminated fruit and vegetation included HQ values = 3 for fruit and 6 for vegetation. No other non-accidental scenarios (including swimming) exceed a threshold of concern.	selective application. Direct spray of a person is implausible with these methods. Consumption of contaminated fruit is implausible both because the amount of fruit that would have to be consumed and the project design criteria that require posting of treated areas and use of dye to mark treated areas. It is even less likely that someone would eat a pound of contaminated vegetation after it has been sprayed. Upper bound estimates also are extreme; central estimates are more realistic, especially given the project design criteria associated with the Umatilla project, including avoiding use of triclopyr (especially BEE) in areas of high public use and forest product gathering.
Triclopyr BEE - For an accidental spill of 200 gallons of herbicide into a small pond, the HQ = 2 for a small child drinking water out of the	Triclopyr BEE - For an accidental spill of 200 gallons of herbicide into a small pond, the HQ = 2 for a small child drinking water out of	No change.

Triclopyr (2003)	Triclopyr (2011)	Changed Condition Findings
pond immediately after the spill.	the pond immediately after the spill.	

WORKER EXPOSURE TO HERBICIDES

The glyphosate risk assessment (SERA 2011) stated that "some recent studies raise concern that glyphosate and some glyphosate formulations may be able to impact endocrine function through the inhibition of hormone synthesis (Richard et al. 2005; Benachour et al.2007a, b), binding to hormone receptors (Gasnier et al. 2009), or the alteration of gene expression (Hokanson et al. 2007)" (all references as cited in SERA 2011). Evaluation of the studies indicates that endocrine disruption effects were indicated for surfactants in the formulations rather than glyphosate itself. The current project requires the use of the aquatic formulation of glyphosate which does not contain the types of surfactants implicated in concern over endocrine effects. A commercial surfactant would be added to glyphosate when preparing the solution for application, but the surfactant type of choice is methylated seed oil/crop oil concentrate, which is typically a corn oil derivative and not implied in causing endocrine effects. PDFs reduce the application rate for NPE surfactants and address this concern.

PUBLIC EXPOSURE TO HERBICIDES

The updated risk assessments increased some HQ values, and reduced others, however the overall findings in the 2010 FEIS remain valid. The 2011 risk assessments included a new exposure scenario of a woman eating 1 1b.of contaminated vegetation immediately after spraying. This leads to higher HQ values than consumption of contaminated fruit. Actual adverse effects are still not expected due to the unlikely nature of the scenario occurring.